

WHAT IS CLAIMED IS:

1. A method for balancing a spindle assembly comprising steps of:
 - (a) providing a spindle assembly having a spindle rotationally coupled to a spindle portion and including adjustable eccentric rings;
 - (b) measuring an imbalance of the spindle assembly and the eccentric rings preassembled with the spindle assembly; and
 - (b2) dynamically balancing the spindle assembly by adjusting the eccentric rings based upon the measured imbalance of a combined structure of the spindle assembly and the eccentric rings.
2. The method of claim 1 wherein the imbalance of the spindle assembly and the eccentric rings is measured with the rings in a dynamically balanced position.
3. The method of claim 1 wherein the step of adjusting the eccentric rings comprises the step of:
 - (c) rotating the spindle while engaging one of the eccentric rings to adjust alignment of the one of the eccentric rings to dynamically balance the spindle assembly.
4. The method of claim 3 wherein the spindle is rotated by a head having at least one head pin adapted for insertion into a bore of the spindle and comprising steps of:
 - (d) inserting the at least one head pin into the bore of the spindle to engage the spindle; and
 - (e) rotating the head to rotate the spindle.

5. The method of claim 4 and further comprising the step of:
 - (f) measuring alignment of the spindle;
 - (g) rotating the head prior to inserting the at least one head pin into the bore of the spindle to align the at least one head pin relative to the bore of the spindle.
6. The method of claim 3 wherein the spindle assembly is coupled to a mounting plate connected to a drive chassis and the step of engaging the one of the eccentric rings comprises:
 - (f) inserting a probe through an opening in the mounting plate to engage the one of the eccentric rings.
7. The method of claim 1 wherein the step of adjusting the eccentric rings comprises steps of:
 - (d) aligning a probe relative to a first eccentric ring and engaging the first eccentric ring;
 - (e) rotating the spindle to adjust the first eccentric ring;
 - (f) withdrawing the probe from the first eccentric ring;
 - (g) aligning the probe relative to a second eccentric ring and engaging the second eccentric ring; and
 - (h) rotating the spindle to adjust the second eccentric ring.
8. The method of claim 4 and further comprising the step of:
 - (f) inserting opposed spindle pins into openings on opposed ends of the spindle portion to support the spindle assembly for balancing.
9. The method of claim 1 wherein the measured imbalance is recorded on a device tag and further comprising the step of:
 - (c) downloading the measured imbalance to a controller to adjust the eccentric rings based upon the measured imbalance.

10. The method of claim 8 wherein one of said spindle pins extends through a channel of the head and is biased in an extended position and comprising the step of:

- (g) retracting the spindle pin in the channel of the head against the bias to engage the head with the spindle for rotation.

11. The method of claim 6 wherein the probe is supported on a lift coupled to an axial slide and comprising steps of:

- (g) operating the slide to move the probe to selectively align with first and second eccentric rings; and
- (h) operating the lift to raise the probe to engage the first and second rings and lower the probe to disengage the first and second rings.

12. A method for balancing a spindle assembly comprising steps of:

- (a) providing a spindle assembly having a spindle rotationally coupled to a spindle portion and including adjustable eccentric rings; and
- (b) dynamically balancing the spindle assembly by adjusting the eccentric rings based upon an imbalance of a combined structure of the spindle assembly and the eccentric rings.